REMARKS/ARGUMENTS

Claims 1-7 and 9-12 are presently pending in this application. Claim 8 has been canceled.

A principal object of the present invention as defined by independent claims 1 and 12 is to monitor a two-dimensional space in a short period of time. The object is solved by pivoting a plurality of simultaneously transmitted light signals or beams about an axis and detecting the plurality of reflected/remitted signals or beams with a plurality of photodiodes. In this way a two-dimensional space can be monitored in a short period of time.

All claims were rejected for obviousness over Endo (4,634,272) and the newly cited Bodlaj patent (4,212,534) because Endo was viewed as teaching all features of the claimed invention except for the light deflection device associated with the light transmitter. Bodlaj was considered to provide what is missing from Endo, namely a light deflection device at the light transmitter.

Specifically, the Office Action asserts that Endo discloses a light transmitter "simultaneously transmitting a plurality of light signals (Lt of figure 3) in the direction of a plurality of reflection or emission points (42,43,44 of figure 2) disposed in the monitored space and spaced apart from one another (figure 3)".

Applicant disagrees that Endo discloses a light transmitter which simultaneously transmits a plurality of light signals. As is disclosed in column 2, lines 6-20, of Endo and shown in Fig. 1, phototransmitter 21 has a light emitting element 24 that produces a search pulse Lt of coherent light which "is transmitted through the lens 25 towards objects to be detected in the form of a beam of coherent light with angle of diverge θt". Thus, contrary to what is stated in the Office Action, Endo does not transmit a plurality of light signals.

In Endo, light reflected from different objects (42, 43, 44 in Fig. 2) is focused by lens 27 onto a transducer 26 "made up of three independent areas 26a, 26b and 26c ...." (column 2, lines 27-29). The light reflected by objects 42, 43, 44 is light from the divergent beam

emanating from light source 21, as is illustrated in Figs. 2 and 3. The reflected light forms different reflected beam segments (shown in Fig. 3) which are sensed by a photodetector array. A "[s]ignal processor 23 determines the respective distances from the system to the objects lying within the detection fields corresponding to transducers 26a, 26b and 26c on the basis of the electrical signals G, H and I" from the transducers (column 2, lines 55-59).

The object of the arrangement disclosed by Endo is to determine the distance between a vehicle, such as a car (column 3, lines 8-22) or an airplane (column 4, lines 16-17), and other vehicles in front of it to maintain "a safe inter-vehicle distance (e.g., about 50 m)" (column 3, lines 17-18). The angle of divergence of the light beam "is chosen so as to approximately cover the width of the road lane (e.g., about 3.5 m)" (column 3, lines 16-17).

Thus, in Endo a single, diverging light beam is projected forwardly of the vehicle, and objects, e.g. vehicles in front of it struck by the light beam, reflect light back onto the photoreceivers. Distances between the light emitter (vehicle) and the objects in front of it are determined on the basis of the time it takes the various portions of the emitted/reflected light beam to be received by the photodetectors.

As pointed out in the Office Action, Bodlaj has a light deflector which scans a single light beam from a laser 12 over a predetermined angle.

Neither Endo nor Bodlaj contain any suggestion to combine them. If one were to nevertheless combine them in the manner they were combined in the rejection of the pending claims, a light beam deflector would be added to Endo's system. The result thereof is that light beam Lt would pivot over a predetermined angular range. Since Endo's light beam must already diverge sufficiently so that it covers the width of the lane where vehicles may be present, e.g. 3.5 m, pivoting the light beam would either make no difference whatsoever, because the same light beam would still be reflected by the same object (42, 43, 44), or the light beam could be pivoted too far to one side or the other as to miss one of the objects ahead of it. The latter alternative would clearly be undesirable because it would defeat the purpose of the system disclosed by Endo, namely detecting possible objects in the path of the vehicle.

Deflecting or pivoting Endo's light beam Lt would not result in any different reading at the photodetectors (26a-26c) than when the light beam is stationary and not deflected or pivoted, as is in fact disclosed by Endo. Thus, combining Bodlaj with Endo would either serve no purpose (so long as the pivoting light beam stays within a range where it impinges on the locations of possible objects in front of the vehicle) or the combination would defeat the object of Endo's invention, namely detecting possible objects within the operating width range (e.g. 3.5 m) of the system.

Consequently, one of ordinary skill in the art (a) can find no reason in either Endo or Bodlaj to combine the two references in the manner they were combined in the Office Action, and (b) would not be otherwise motivated to combine the references because, at best, such a combination would be pointless and, at worst, it may render the device of Endo incapable of achieving its objective of detecting the possible presence of an object within the operating width range of the system.

Thus, the rejection of the claims over Endo in view of Bodlaj is a rejection based on a reconstruction of the prior art based not on what is disclosed or suggested in the prior art, but what is taught by the present application. In other words, the rejection is an improper hindsight rejection that must be withdrawn.

In view of the foregoing, applicant submits that independent claims 1 and 12, and therewith all depending claims, are not obvious over Endo and Bodlaj, taken singly or in combination.

CONCLUSION

The present application is therefore in condition for allowance, and the issuance of a formal notification to that effect at an early date is requested.

If the Examiner believes a telephone conference would expedite prosecution of this application, please telephone the undersigned at 415-576-0200.

Respectfully submitted,

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